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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,007	06/28/2005	Mark J Childs	GB030001US1	9031

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PHILIPS INTELLECTUAL PROPERTY & STANDARDS
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EXAMINER	
ZHU, JOHN X	

ART UNIT	PAPER NUMBER
2858	

MAIL DATE	DELIVERY MODE
12/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/541,007	CHILDS, MARK J	
	Examiner	Art Unit	
	John Zhu	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 September 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Response to communications filed on 9/20/2007.

Claim Objections

2. Claim 19 is objected to because of the following informalities: method claim 19 depends from claim 12, an apparatus claim. For the purpose of examination, claim 19 will be read as depending from claim 14. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 1, 2, 10, 13, 14, 15 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Busse et al. (6,653,636 B2) in view of Abdalla et al. (NPL cited by applicant).

With respect to claims 1 and 14, Busse discloses a image sensor and method of measuring light intensity comprising a plurality of pixels, each pixel comprising a light sensor element (Fig. 1, 1), a sensor voltage across the element varying depending on the light incident on the element (1), a sampling capacitor (26) being charged by a voltage amplifier (Source follower 21 and 23) and measuring the flow of charge required to charge the sampling capacitor (via elements 30, 31 and 11).

Busse does not explicitly disclose a voltage amplifier having a gain greater than 1.

Abdalla discloses a push-pull amplifier system (Fig. 1, elements M4-M7) in series with a source follower (M1 and M2) with a gain of greater than 1 (Page 233, column 2, lines 1-4).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Busse to include a push-pull amplifier system in addition to the source follower as taught by Abdalla for the purpose of providing a preamplifier in the pixel itself in order to increase the optical sensitivity.

With respect to claim 2, Busse further discloses a pixel storage capacitor (Fig. 1, 2) connected to the light sensor element 1.

With respect to claim 13, Busse further discloses an input switch (27) for applying a fixed potential across the light sensor element.

With respect to claim 15, Busse further discloses a reset operation is carried out before amplifying the sensor voltage (22,25), the reset operation comprising applying a known potential to one terminal of the sampling capacitor and applying a known potential across the sensor element (Fig. 2, line 4), the amplified voltage being subsequently applied (Output of 21, 23) to the other terminal of the sampling capacitor.

With respect to claims 10 and 19, Busse as modified by Abdalla discloses the voltage gain being 30 (Page 233, column 2, lines 1-4) but does not disclose the gain being in a range of 2 and 5.

However, this gain is not a fixed gain for all pixel preamplifications as different systems requires different gains with corresponding optical sensitivity.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Busse and Abdalla to include different ranges of voltage amplification for the purpose of satisfying different pixel configurations' sensitivity needs.

5. Claim 3-9 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Busse and Abdalla as applied to claims 1 and 14 above, and further in view of Kozlowski (6,417,504 B1).W

With respect to claims 3-9 and 16-18, Busse as modified does not explicitly disclose the capacitance of the sampling capacitor is less than 10 times and 2 times the capacitance of the pixel storage capacitor, them being approximately equal, or the capacitance of the sampling capacitor is in a range of 0.5pF to 3pF, and the capacitance of the storage capacitor is in the range of 0.5pF to 3pF..

Kozlowski disclose the sampling capacitor (Cclamp) being at least 1 fF (Column 5, lines 8-9)for operation at room temperature, and the storage capacitor (detector capacitance) being of the order 5 to 25 fF (Column 3, lines 28-35). With these values, it can be seen that the limitations of 10 times, 2 times and equivalent capacitance can be

achieved simply by optimization of ranges. It can also be seen that different designs of pixel matrices would require different size components and thus different capacitance values. Furthermore, it is noted that such optimization by routine experimentation is not patentably distinct. See MPEP 2144.05 and *In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235(CCPA 1955)*.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Busse and Abdalla to include the specific capacitance ratios and ranges for the purpose of improved signal to noise ratio for specific designs of pixel matrices.

6. Claims 11, 12 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Busse and Abdalla as applied to claim 1 above, and further in view of Marshall et al. (6,858,912 B2).

With respect to claims 11, 12 and 20, Busse as modified by Abdalla discloses the output of the voltage amplifier is connected to one terminal of the sampling capacitor (26), the other terminal is connected to the output through an output switch (30). Busse as modified does not explicitly disclose the voltage amplifier with a gain greater than 1 comprises first and second transistors in series between power lines, the light sensor element being connected to the gate of the second transistor, a bias voltage being connected to the gate of the first transistor, and the output of the voltage amplifier being defined at the connection between the first and second transistor, wherein the second transistor has a non-unity gain.

Marshall discloses a voltage amplifier that comprises a first (Fig. 5, MA52) and second transistor (MA51) with a non-unity gain (Column 8, lines 64-65), the light sensor being connected to the gate of MA51, a bias voltage (activate) being connected to the gate of MA52, and the output of the voltage amplifier being defined as the connection between the two transistors (52).

As Marshall teaches that the push-pull amplifier (Fig. 7) can replace a common source amplifier (Fig. 5), it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Busse and Abdalla to incorporate the common source amplifier as taught by Marshall in place of the push-pull amplifier for the predictable result of providing in-pixel amplification to increase sensitivity.

Response to Arguments

7. Applicant's arguments with respect to all claims have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Zhu whose telephone number is (571) 272-5920. The examiner can normally be reached on M-F, 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Hirshfeld can be reached on (571) 272-2168. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

John Zhu
Examiner
Art Unit 2858

JZ

ANDREW H. HIRSHFELD
SUPERVISORY PATENT EXAMINER
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